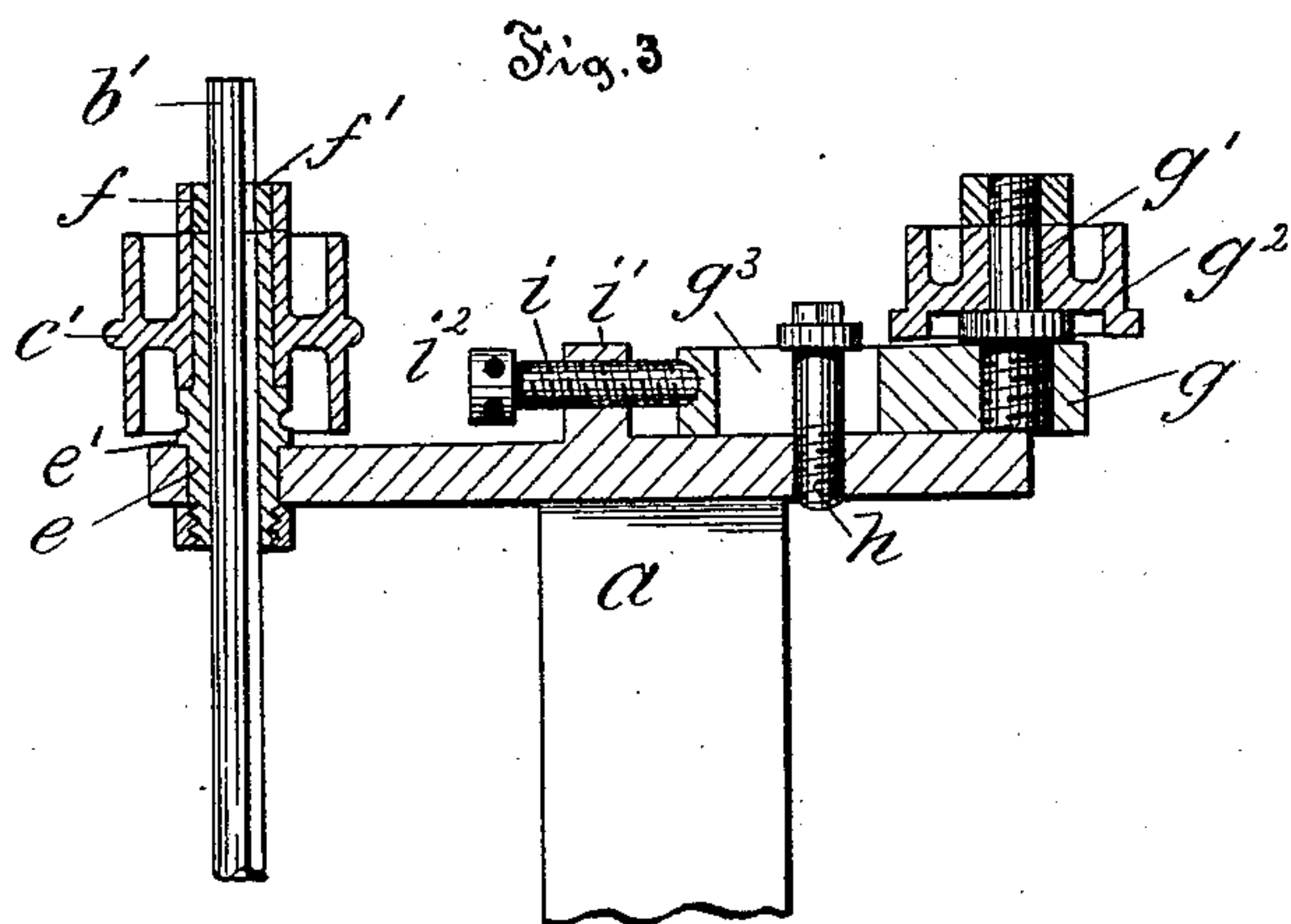
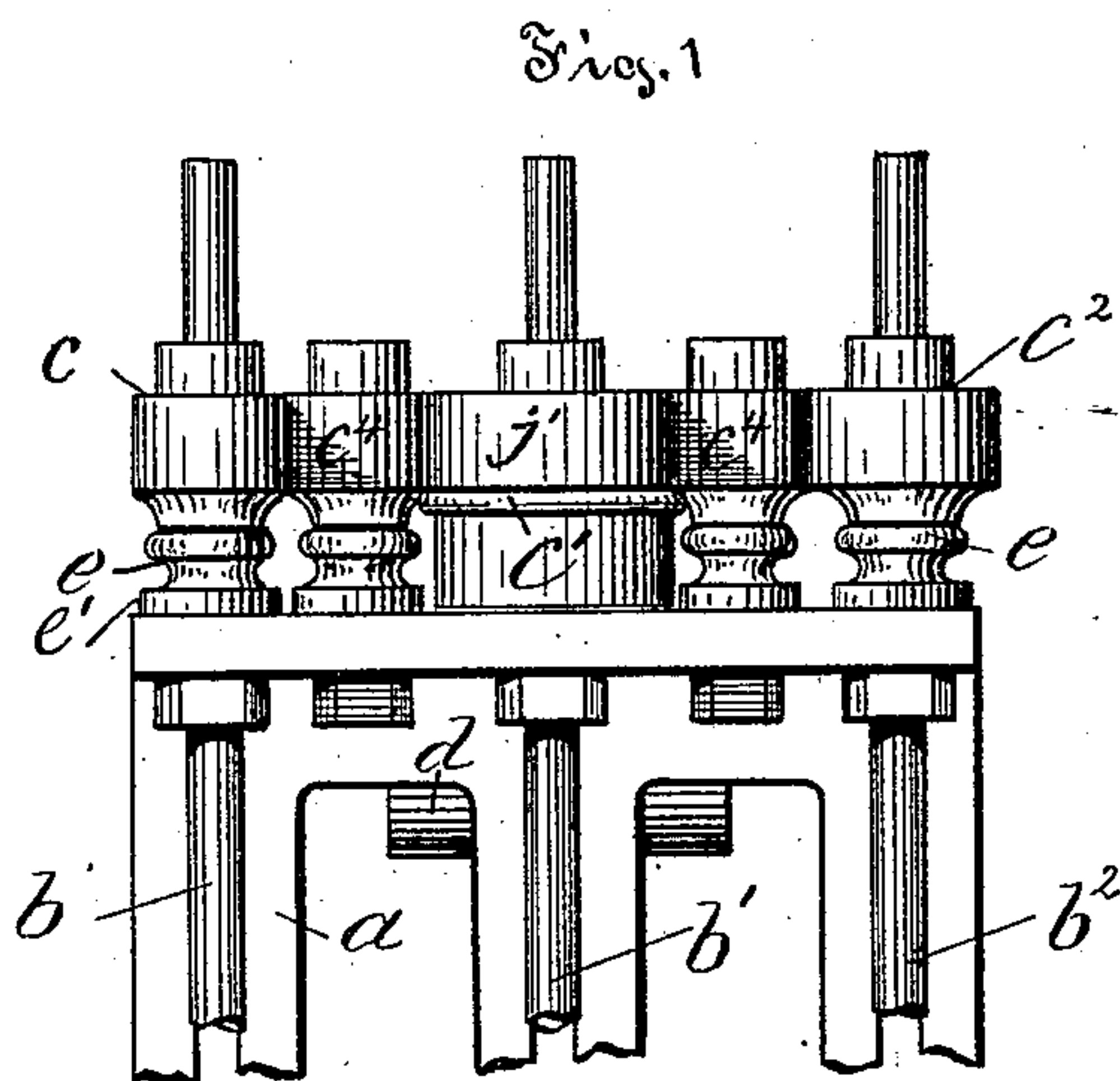
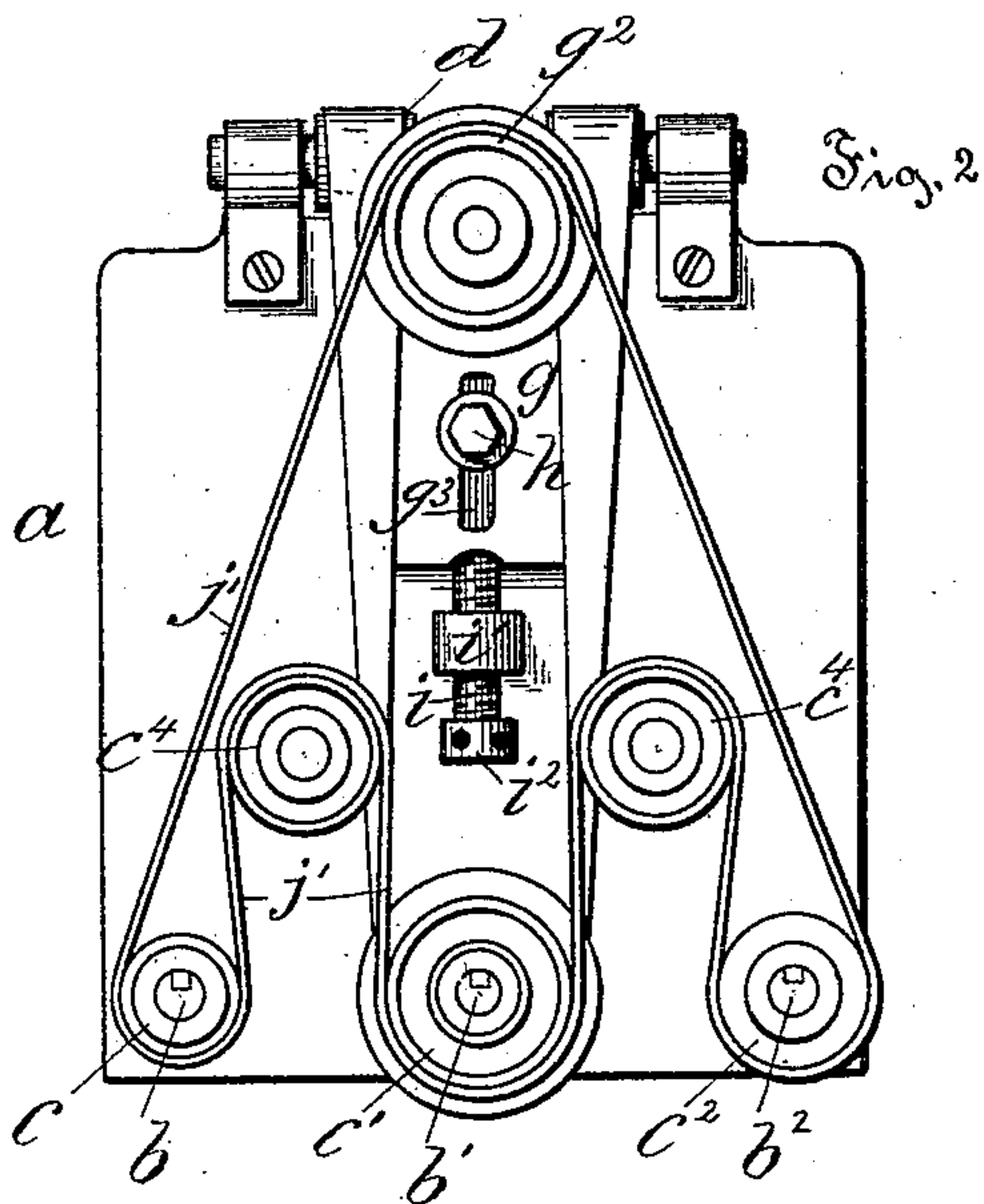


(No Model.)

D. SLATE.
DRILLING MACHINE.

No. 347,969.

Patented Aug. 24, 1886.



Witnesses:

H. R. Williams
E. P. Pelton.

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UNITED STATES PATENT OFFICE.

DWIGHT SLATE, OF HARTFORD, CONNECTICUT.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 347,969, dated August 24, 1886.

Application filed June 16, 1886. Serial No. 205,311. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT SLATE, of Hartford, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My improvement relates more particularly to the class of upright drills and like machine-tools that have a plural number of parallel and rotary spindles, each adapted to carry a boring or like tool, although it is also applicable to a single spindle-drill; and the object of my improvement is to provide means for driving these several spindles by an endless belt common to all of them.

To this end my improvement, as shown in the within-described machine, consists in a plural number of parallel driving-spindles bearing pulleys lying in a common plane, a pulley lying in the same plane and borne on a block adjustable in this plane, and an endless belt common to all of the said pulleys; and it further consists in the combination of the pulley borne on the driving-spindle, a pulley borne on a block adjustable to and from the spindle, and an endless belt connecting said pulleys, as more particularly hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a front view of the upper part of a gang-drill embodying my improvement. Fig. 2 is a top view of the same. Fig. 3 is a view in vertical section through the adjustable block bearing the movable pulley.

In the accompanying drawings, the letter *a* denotes the spindle-frame, supported on the upper part of the standard or column of the drill, and on this frame are borne the rotary drill-spindles *b* *b'* *b''* and driving-pulleys *c*, *c'*, *c''*, and *d*. Each drill-spindle passes through a tubular post, *e*, that is secured to the top of the frame by a nut fitting the threaded shank that projects below a shoulder, *e'*, on the post, and through the top of the frame. Each of the drill-spindles has a rotary and a lengthwise-sliding movement in its tubular post. The pulley appurtenant to each spindle is free to rotate on the post, but is united to the spindle by a collar, *f*, attached to the pul-

ley, and bearing a feather, *f'*, entering a lengthwise groove in the spindle, so that the drill-spindle is rotated with the pulley and can at the same time be moved up and down through it. These features are old and are common to drills made by me for many years.

In the machine shown in the drawings the pulleys lie in the same horizontal plane, practically one parallel to the top of the frame *a*, and at a convenient distance back of the several spindles is attached a sliding block, *g*, movable on the top of the frame and bearing on a vertical arbor, *g'*, a loose pulley, *g''*. Means are provided for clamping this block at any point in its path in the bolt *h*, that passes through a hole in the frame-top, and also through the slot *g'''* in the block *g* and the nut *g'''*, the edges of which overhang the sides of the slot. In order to prevent the block from turning on this bolt *h*, the block may be fitted to the frame-top with a tongue and groove between the parts, while the threaded bolt *i*, socketed in the nut *i'*, formed in a lug fast to or a part of the top of the frame, takes with one end against the end of the block, and has a capstan-head, *i''*, to enable it to be used as a feed-screw to forcibly tighten the belt *j'*, that is common to the several pulleys above described. This belt *j'* is formed of a single piece of material, as leather, without break, joint, or seam—in brief, is endless—and by passing around the idle-pulley *c''*, borne on studs fast to the frame, serves to drive the several drill-spindles in the same direction.

The advantage of the endless belt arranged as described is, that all stretch due to wear is readily taken up by moving the block *g* away from pulleys *c*, and it drives the spindles with a positive regular motion.

A belt that passes over the driving-pulleys *d* on the back of the frame runs on the lower part of the double pulley *c'*, the face of which is divided by a flange, while the endless belt common to the other spindles runs on the upper part of the pulley.

I claim as my improvement—

1. In a drilling-machine, the combination of the frame, the drill-spindle with appurtenant pulley, the loose pulley borne on a block adjustable toward and from the drill-spindle and the clamp device whereby the block is

secured to the frame, all substantially as described.

2. In a drilling-machine, the combination of the frame *a*, the several drill-spindles, one
5 of which bears a double pulley, *c'*, the adjustable block *g*, bearing a loose pulley, the clamp device for securing the block to the frame, the

feed-screw, and the idle-pulleys, all substantially as described.

DWIGHT SLATE.

Witnesses:

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